

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	: **09/890,490**
Applicant(s)	: **YEO et al.**
Filed	: **31 Jul 2001**
TC/A.U.	: **2685**
Examiner	: **NGUYEN, Duc M.**
Atty. Docket	: **N-17751**

Title: **TUNER ALIGNMENT**

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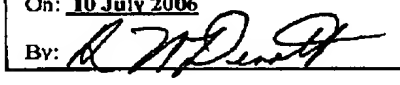
By: 

Mail Stop: **APPEAL BRIEF - PATENTS**
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APPEAL UNDER 37 CFR 41.37

Sir:

This is an appeal from the decision of the Examiner dated 9 February 2006, finally rejecting claims 10-11 and 13-20 of the subject application.

This paper includes (each beginning on a separate sheet):

1. **Appeal Brief, with appendices; and**
2. **Credit card authorization in the amount of $500.**

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APPEAL BRIEF

I. REAL PARTY IN INTEREST

The above-identified application is assigned, in its entirety, to **Koninklijke Philips Electronics N. V.**

II. RELATED APPEALS AND INTERFERENCES

Appellant is not aware of any co-pending appeal or interference that will directly affect, or be directly affected by, or have any bearing on, the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-9 and 12 are canceled.

Claims 10-11 and 13-20 are pending in the application.

Claims 13-15 and 17 stand rejected by the Examiner under 35 U.S.C. 102(a).

Claims 10-11 and 13-20 stand rejected by the Examiner under 35 U.S.C. 103(a).

These rejected claims are the subject of this appeal.

IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to the final rejection in the Office Action dated 9 February 2006. A reply to the final rejection was filed on 20 March 2006.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The invention includes a receiver and method for receiving and demodulating a received RF signal to produce a digital output signal, such as an MPEG video output. As contrast to the conventional scheme of tuning filters to obtain peak/optimal analog signals, on the assumption that an optimal analog signal will necessarily provide an optimal digital signal, the demodulation process of this invention provides a digital figure of merit associated with a demodulated digital output signal, and this figure of merit is used to adjust one or more of the RF filters used to filter the RF input signal. In a preferred embodiment, the figure of merit is used to adjust a center frequency of at least one of the filters based on a bit-error-rate (BER) of the digital output signal.

As claimed in independent claim 13, the invention comprises a method that includes:

receiving an RF input signal (RF-in, in applicants' single figure; page 3, line 31 of applicants' specification),

filtering the RF input signal via one or more RF filters (In-filt, Band-filt) to provide a filtered RF signal (page 3, lines 31-32),

mixing (Mix/Osc) the filtered RF signal with an oscillator signal (Osc-tank) to provide an IF signal (IF-out) (page 3, line 33- page 4, line 1),

demodulating (IF-downconv-2, Dig-dem) the IF signal to provide a digital output signal (MPEG2 TS) and a figure of merit (BER) associated with the digital output signal (page 4, lines 6-17), and

adjusting (uP, PLL) at least one filter of the one or more RF filters based on the figure of merit (page 4, lines 17-26).

As claimed in independent claim 10, the invention comprises a receiver (applicants' figure) for a digital signal, the receiver comprising:

one or more filters (In-filt, Band-filt) that are configured to filter an input signal to obtain a processed signal (page 3, lines 31-32);

a decoder (Dig-dem) that is configured to determine a digital figure of merit (BER) from the processed signal (page 4, lines 6-17); and

a controller (uP, PLL) that is configured to adjust a center frequency of at least one of the one or more filters in dependence on the digital figure of merit (page 5, lines 3-10),

wherein

the one or more filters include:

an input filter (In-filt), and

a double tuned band-filter (Band-filt) (page 3, lines 31-32).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 13-15 and 17 stand rejected under 35 U.S.C. 102(a) over Kim (USP 5,963,856).

Claims 16 and 18 stand rejected under 35 U.S.C. 103(a) over Kim and Porambo et al. (USP 5,280,638, hereinafter Porambo).

Claim 20 stands rejected under 35 U.S.C. 103(a) over Kim and Liebetreu et al. (USP 5,949,832, hereinafter Liebetreu).

Claims 10 and 11 stand rejected under 35 U.S.C. 103(a) over Kim and Sakashita et al. (USP 4,939,789, hereinafter Sakashita).

Claims 13-20 stand rejected under 35 U.S.C. 103(a) over Porambo and Liebetreu.

Claims 10 and 11 stand rejected under 35 U.S.C. 103(a) over Porambo, Liebetreu, and Sakashita.

VII. ARGUMENT

Claims 13-15 and 17 stand rejected under 35 U.S.C. 102(a) over Kim.

MPEP 2131 states:

> "A claim is anticipated only if ***each and every element*** as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The ***identical invention*** must be shown in as ***complete detail*** as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Claims 13-15 and 17

Claim 13, upon which claims 14-20 depend, claims a method that includes demodulating an IF signal to provide a digital output signal and a figure of merit associated with the digital output signal, and adjusting an RF filter based on the figure of merit.

Kim does not teach providing a figure of merit associated with a demodulated digital output signal.

Kim teaches that the baseband processing module 210 includes an analog to digital converter 211 that provides the baseband digital output signal:

> "Thereafter, as previously described, the IF signal is demodulated to baseband I ("In" phase) and Q ("Quadrature" phase) signals. Demodulation is done in a conventional manner in I/O demodulators 212 and 213, using signals from local oscillator 214 (LO2) and phase shifter 215. Thereafter, baseband processing unit 210, which, illustratively, includes an Analog to Digital Converter (ADC) 211 and a digital receiver 216, recovers the baseband signal in a conventional manner." (Kim, column 4, line 67 through column 5, line 3.)

Kim does not further address the baseband output signal, and specifically does not teach deriving a figure of merit associated with this digital output signal.

Kim specifically teaches that the control signal 201 that is used to control the input stages is formed at the demodulator 213, which is prior to the baseband processing module 210 that provides the digital output signal:

> "In conventional scheme, an Automatic Frequency Control (AFC) loop (not shown) in receiver 213 senses the correct frequency and the local oscillator frequency is adjusted accordingly by the frequency synthesizer 207 (LO1). The AFC generates the control signal 201 to control the frequency band selection of both the tunable duplexer 204 and the local oscillator frequency selection of frequency synthesizer 207." (Kim, column 4, lines 19-26.)

As is clearly evident in Kim's teachings, Kim uses the conventional technique of adjusting the local oscillator frequency in an AFC control loop to obtain a peak output from the demodulator. Kim specifically teaches using this same AFC control loop to generate the control signal 201 that selects the band to use in the RF duplexer 204.

In the Examiner's Answer of 18 April 2006, the Examiner asserts that any signal quality characteristic would read on the applicants' claimed 'figure of merit'. While the applicants agree with this assertion, the applicants respectfully note that such a figure of merit must be associated with the digital output signal in order to read on the applicants' claimed figure of merit, and Kim's conventional AFC loop control signal is independent of the digital output signal.

Because Kim fails to teach adjusting an RF filter based on a figure of merit associated with a demodulated digital output signal, as specifically claimed in claim 13, the applicants respectfully maintain that the rejection of claims 13-15 and 17 under 35 U.S.C. 102(a) over Kim is unfounded, per MPEP 2131.

Claims 16 and 18 stand rejected under 35 U.S.C. 103(a) over Kim and Porambo

MPEP 2142 states:

> "To establish a *prima facie* case of obviousness ... the prior art reference (or references when combined) ***must teach or suggest all the claim limitations***... If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness."

Claims 16 and 18

Each of claims 16 and 18 depends upon claim 13, discussed above with regard to Kim.

In this rejection, the Office action relies upon Kim for teaching the elements of claim 13. As noted above, Kim fails to teach adjusting an RF filter based on a figure

of merit associated with a demodulated digital output signal, as specifically claimed in claim 13, and therefore the applicants respectfully maintain that the rejection of claims 16 and 18 under 35 U.S.C. 103(a) that relies upon Kim for this teaching is unfounded, per MPEP 2142.

Claim 20 stands rejected under 35 U.S.C. 103(a) over Kim and Liebetreu
Claim 20

Claim 20 depends upon claim 13, discussed above with regard to Kim.

In this rejection, the Office action relies upon Kim for teaching the elements of claim 13. As noted above, Kim fails to teach adjusting an RF filter based on a figure of merit associated with a demodulated digital output signal, as specifically claimed in claim 13, and therefore the applicants respectfully maintain that the rejection of claim 20 under 35 U.S.C. 103(a) that relies upon Kim for this teaching is unfounded, per MPEP 2142.

Claims 10 and 11 stand rejected under 35 U.S.C. 103(a) over Kim and Sakashita
Claims 10 and 11

Claim 10, upon which claim 11 depends, claims a receiver for a digital signal that includes a decoder that is configured to determine a digital figure of merit, and a controller that is configured to adjust a center frequency of at least one of an input filter, and a double tuned band-filter in dependence on the digital figure of merit.

In this rejection, the Office action states: "Regarding claim 10, Kim would disclose all the claimed limitations, see claim 13 above, except for the tunable filter 206 is a double tuned band filter".

As noted above, Kim's decoder 210 does not provide a digital figure of merit that is used to adjusting an input filter, and therefore the applicants respectfully maintain that the rejection of claims 10 and 11 under 35 U.S.C. 103(a) that relies upon Kim for this teaching is unfounded, per MPEP 2142.

Claims 13-20 stand rejected under 35 U.S.C. 103(a) over Porambo and Liebetreu

Claims 13-20

As noted above, claim 13, upon which claims 14-20 depend, claims a method that includes demodulating an IF signal to provide a digital output signal and a figure of merit associated with the digital output signal, and adjusting an RF filter based on the figure of merit.

Both Porambo and Liebetreu fail to teach adjusting an RF filter based on a figure of merit associated with a demodulated digital output signal.

Both Porambo and Liebetreu teach the conventional technique of adjusting a filter within a stage of the receiver based on the output of that stage. The applicants claim a method that includes at least two stages: converting the RF signal to an IF signal and (2) converting the IF signal to a baseband signal; and claim adjusting filters in the first stage based on a digital output of the second stage. The applicants teach disadvantages associated with the independent tuning of each stage at page 1, line 22 through page 2, line 2.

Liebetreu's FIG. 1 clearly identifies an RF-to-IF stage (12, 14, 16) that is independent of the subsequent IF-to-baseband stage. Liebetreu does not teach or suggest that the RF-to-IF stage is in any way affected by the disclosed control signals based on the output of the IF-to-baseband stage.

Porambo's FIG. 3 clearly identifies an IF-to-baseband stage (FM DEMOD 42, or AM DEMOD 31) that is independent of the preceding RF-to-IF stage. Porambo does not teach or suggest that the IF-to-baseband stage is in any way affected by the disclosed control signals based on the output of the RF-to-IF stage.

Thus, neither Liebetreu nor Porambo teaches or suggests adjusting a filter in a first stage (RF-to-IF stage) based on a figure of merit associated with an output of a second stage (IF-to-baseband stage), as specifically claimed.

The applicants further maintain that a combination of Liebetreu and Porambo will not result in the applicants' claimed invention. Because each of Liebetreu and Porambo teaches independent RF-to-IF and IF-to-baseband stages, a combination of

Liebetreu and Porambo, absent the applicants' teachings, will result in an RF-to-IF stage of Porambo followed by an IF-to-baseband stage of Liebetreu. There is no suggestion in either Liebetreu or Porambo to control the RF-to-IF stage based on an output of the IF-to-baseband stage, as taught and claimed by the applicants.

Because neither Liebetreu nor Porambo, individually or in combination, teaches or suggests adjusting a filter in a first stage (RF-to-IF stage) based on a figure of merit associated with an output of a second stage (IF-to-baseband stage), as specifically claimed in claim 13, the applicants respectfully maintain that the rejection of claims 13-20 under 35 U.S.C. 103(a) over Porambo and Liebetreu is unfounded, per MPEP 2142.

Claims 10 and 11 stand rejected under 35 U.S.C. 103(a) over Porambo, Liebetreu, and Sakashita.

Claims 10 and 11

Claim 10, upon which claim 11 depends, claims a receiver for a digital signal that includes a decoder that is configured to determine a digital figure of merit, and a controller that is configured to adjust a center frequency of at least one of an input filter, and a double tuned band-filter in dependence on the digital figure of merit.

In this rejection, the Office action states: "Regarding claim 10, Porambo as modified [by Liebetreu] would disclose all the claimed limitations, see claim 13 above, except for the tunable filter 206 is a double tuned band filter".

The applicants respectfully maintain that a combination of Liebetreu and Porambo will not result in the applicants' claimed invention.

Porambo teaches a controller that is configured to adjust a center frequency of an input filter, but does not teach a decoder, and therefore cannot be said to teach adjusting an input filter based on digital figure of merit from a decoder.

Liebetreu teaches a decoder that is configured to determine a digital figure of merit, but Liebetreu teaches adjusting a bandwidth, and not the center frequency, of the IF filters to reduce noise:

> "The bandwidth of filters 20 and 22 is adjusted in response to a current tuning control signal (labeled TUNECONTROL). The TUNECONTROL signal is described in more detail below. Receiver 10 regulates the bandwidth of the analog filtering circuit to reduce unwanted noise in the encoded data signal." (Liebetreu, column 3, lines 12-17.)

Because each of Liebetreu and Porambo teaches independent RF-to-IF and IF-to-baseband stages, a combination of Liebetreu and Porambo, absent the applicants' teachings, will result in an RF-to-IF stage of Porambo followed by an IF-to-baseband stage of Liebetreu. There is no suggestion in either Liebetreu or Porambo to control the center frequency of an input filter based on a digital figure of merit from a decoder, as taught and claimed by the applicants. Therefore the applicants respectfully maintain that the rejection of claims 10 and 11 under 35 U.S.C. 103(a) that relies upon Porambo as modified by Liebetreu for this teaching is unfounded, per MPEP 2142.

CONCLUSIONS

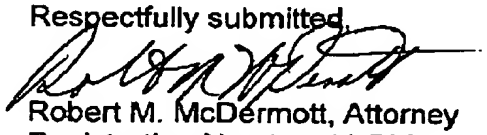
Because Kim fails to teach adjusting an RF filter based on a figure of merit associated with a demodulated digital output signal, the applicants respectfully request that the Examiner's rejection of claims 13-15 and 17 under 35 U.S.C. 102(a), and claims 16, 18, and 20 under 35 U.S.C. 103(a) be reversed by the Board, and the claims be allowed to pass to issue.

Because Kim fails to teach a decoder that provide a digital figure of merit that is used to adjust an input filter, the applicants respectfully request that the Examiner's rejection of claims 10 and 11 under 35 U.S.C. 103(a) be reversed by the Board, and the claims be allowed to pass to issue.

Because a combination of Porambo and Liebetreu fails to teach adjusting an RF filter based on a figure of merit associated with a demodulated digital output signal, the applicants respectfully request that the Examiner's rejection of claims 13-20 under 35 U.S.C. 103(a) be reversed by the Board, and the claims be allowed to pass to issue.

Because a combination of Porambo and Liebetreu fails to teach controlling the center frequency of an input filter based on a digital figure of merit from a decoder, the applicants respectfully request that the Examiner's rejection of claims 13-20 under 35 U.S.C. 103(a) be reversed by the Board, and the claims be allowed to pass to issue.

Respectfully submitted,



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CLAIMS APPENDIX

1-9 (Canceled)

10. A receiver for a digital signal, the receiver comprising:

one or more filters that are configured to filter an input signal to obtain a processed signal;

a decoder that is configured to determine a digital figure of merit from the processed signal; and

a controller that is configured to adjust a center frequency of at least one of the one or more filters in dependence on the digital figure of merit,

wherein

the one or more filters include:

an input filter, and

a double tuned band-filter.

11. The receiver of claim 10, further including:

a pre-amp that is configured to operably couple the input filter to the band-filter, and

a mixer that is configured to generate an IF signal from an output of the band-filter,

wherein,

the decoder is configured to receive the IF signal and to produce therefrom a digital output signal and the figure of merit.

12 (Canceled)

13. A method comprising:

receiving an RF input signal,

filtering the RF input signal via one or more RF filters to provide a filtered RF signal,

mixing the filtered RF signal with an oscillator signal to provide an IF signal,

demodulating the IF signal to provide a digital output signal and a figure of merit associated with the digital output signal, and

adjusting at least one filter of the one or more RF filters based on the figure of merit.

14. The method of claim 13, wherein

adjusting the at least one filter includes adjusting a center frequency of the at least one filter.

15. The method of claim 14, further including

adjusting a center frequency of another filter of the one or more RF filters.

16. The method of claim 15, wherein

the adjusting of the center frequency of the at least one filter and the another filter occur sequentially.

17. The method of claim 13, further including

adjusting another filter of the one or more RF filters.

18. The method of claim 17, wherein

the adjusting of the at least one filter and the another filter occur sequentially.

19. The method of claim 18, wherein

the adjusting of the at least one filter and the another filter are based on a first control signal and a second control signal that are each independently determined based on first and second sequences of figures of merit.

20. The method of claim 13, wherein

the figure of merit includes a bit-error rate.

EVIDENCE APPENDIX

No evidence has been submitted that is relied upon by the appellant in this appeal.

RELATED PROCEEDINGS APPENDIX

Appellant is not aware of any co-pending appeal or interference which will directly affect or be directly affected by or have any bearing on the Board's decision in the pending appeal.